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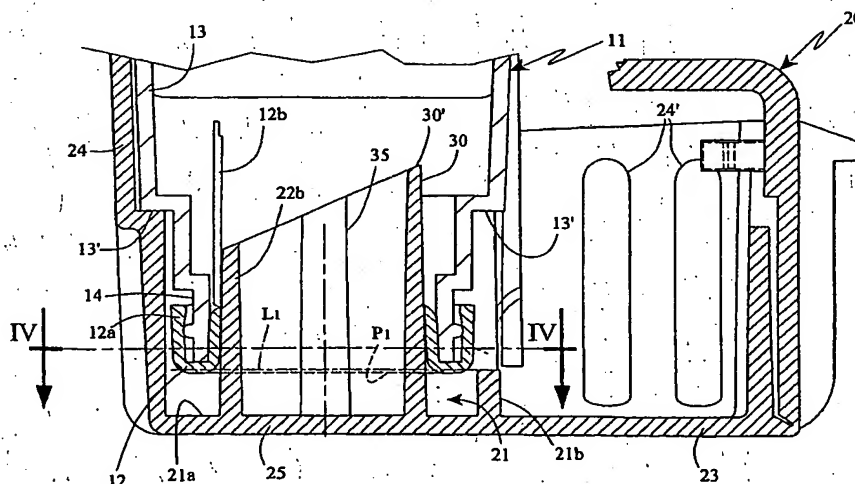
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(54) Title: **LIQUID ACTIVE SUBSTANCE DISPENSER FOR W.C. BOWL**



(57) Abstract: The dispenser comprises a bottle (11) for containing the active substance (R) in the liquid state and provided with an exit mouth (12) for the active substance (R), and a support means (20) for supporting said bottle (11) in an inverted position, in a position subjected to the action of the flushing water flow. The support means (20) comprises, for containing the active substance, a reservoir (21) located in a position subjected to the action of the flushing water flow and arranged to receive the mouth (12) of the bottle, and a member (30) positioned in said containing reservoir (21) to close the mouth (12) of the bottle (11); there is also provided for the active substance at least one passageway associated with said closure member (30) to enable the active substance to pass from the internal chamber of the bottle (11) to the containing reservoir (21). The containing reservoir (21) defines a volume for containing a quantity of active substance which closes said passageway for the active substance.



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DESCRIPTION

LIQUID ACTIVE SUBSTANCE DISPENSER FOR W.C. BOWL

TECHNICAL FIELD

- 5 This invention relates to a dispenser for liquid active substances (deodorants/cleansers/refreshers/disinfectants and the like) for a W.C. bowl.

BACKGROUND ART

- 10 It has been known for some time to use cage-like containers which are suspended below the rim of the W.C. bowl in a position such as to be struck by the flow of flushing water. An active cleansing and/or deodorant and/or air refreshing and/or disinfectant substance in solid block form is placed in the cage, to release its action on encountering the flushing water
15 flow, and be diluted into it.

- One defect is that the quantity of perfuming substance which can be incorporated as a component in the mixture which forms the solid block is relatively small, and moreover some components, and in particular this perfuming substance, are washed out by the water flow more quickly than
20 others, with the result that their action does not have constant behaviour during the life of the block, but rapidly decreases to quickly disappear.

Suitable containers for containing an active substance in the form of a gel are also known, having holes through which the water enters and leaves, entraining with it a part of the dissolved active substance.

- 25 EP 538957 describes a dispenser for a W.C. bowl comprising a bed of sponge material which is suspended below the bowl rim in a horizontal

position, to be lapped by the flushing water flow, On this sponge bed a bottle containing liquid active substance is positioned inverted, with its mouth in contact with the sponge.

Other known solutions are illustrated in the patents EP878586,

5 EP1046756 and WO01/04428, which do not use a sponge bed.

An object of this invention is to provide a device of the type to be housed within a W.C. bowl, comprising a bottle for containing active substance in the liquid state, and having an exit mouth for the active substance and a support means for supporting said bottle with its mouth facing downwards,
10 in a position subjected to the action of the flushing water flow, which is different from known devices and is able to overcome the drawbacks arising in the operation of known devices, and in particular is able to effect a gauged and relatively regular delivery of the active substance from the bottle, so preventing wasteful substance loss.

15 Another object is to provide a dispenser which is of simple low-cost manufacture.

DISCLOSURE OF THE INVENTION

These and further objects are attained by the dispenser of the invention as
20 characterised in the claims.

According to the invention, the support means comprises:

for containing the active substance, a reservoir located in a position subjected to the action of the flushing water flow and arranged to receive the mouth of the bottle, and a member positioned in said containing
25 reservoir to close the mouth of the bottle; and,

for the active substance, a passageway associated with said closure member to enable the active substance to pass from the internal chamber of the bottle to the containing reservoir;

said containing reservoir having about the bottle mouth a wall arranged to
5 define a volume for containing a quantity of active substance which closes said passageway for the active substance.

According to a preferred embodiment the dispenser comprises at least one ventilation passageway which when in use connects the internal chamber of the bottle to atmospheric air, the dimensions of the ventilation
10 passageway being related to the physical-chemical characteristics of the active substance so as to achieve a gauged passage of air towards the bottle interior such that the active substance does not normally leave the bottle, at least not to a relevant extent, whereas it leaves the bottle in a gauged manner when the flushing flow strikes the containing reservoir.

15 The invention is described in detail hereinafter with the aid of the accompanying figures, which illustrate one embodiment thereof by way of non-limiting example.

Figure 1 is a view of a first embodiment of the dispenser of the invention taken on the vertical plane of symmetry I-I of Figure 2

20 Figure 1A is an enlarged detail of Figure 1.

Figure 2 is a top plan view of the support means of Figure 1.

Figure 3 is a section on the plane III-III of Figure 2.

Figure 4 is a section on the plane IV-IV of Figure 1A.

Figure 5 is a perspective view of the support means of Figure 1, without
25 the bottle.

Figure 6 is a front view of Figure 1.

Figure 7 is a section on the vertical plane of symmetry VIII-VIII of Figure 8 through a second embodiment of the dispenser of the invention.

Figure 8 is a top plan view of the support means of Figure 7.

5 Figure 9 is a top plan view of the support means of a third embodiment of the dispenser of the invention.

Figure 10 is a perspective view of Figure 9.

With reference to the first embodiment, shown in Figures 1-6, the dispenser of the invention (indicated overall by 10) comprises a bottle 11
10 for containing, in its internal chamber, an active deodorant/disinfectant substance R, i.e. able to cleanse and/or deodorize and/or air-refresh and/or disinfect, which is in the liquid (more or less viscous) state, and provided with an exit mouth 12 for the active substance R.

The dispenser 10 also comprises a support means 20 having a usual
15 hooking means 28, in the form of a hook-shaped elongate element of elastically flexible material, by which it is hooked to the upper rim 8 of a W.C. bowl 7, and able to support said bottle 11 in an inverted position with its mouth 12 facing downwards, in a position subjected to the action of the flushing water flow.

20 The bottle 11 is separate from the support means 20 and is associated with it in order to be located in the W.C. bowl.

The entire dispenser 10, including the bottle 11, is to be housed within the W.C. bowl 7 against its inner surface 71, below its upper rim 8 and exposed to the action of the flushing water flow. Usually, the water flow
25 emerges either along the rim 8 from holes provided in its lower part, or from a rear central mouth of the bowl and made to flow in a tangential

direction along the inner surface 71, below the rim 8.

The support means 20 comprises, for containing the active substance, a reservoir 21 with an upwardly facing concavity located in a position subjected to the action of the flushing water flow and arranged to receive
5 the mouth 12 of the bottle, and further comprises a member 30 positioned in said containing reservoir 21 to close the mouth of the bottle 11.

The containing reservoir 21 comprises a lower wall 25 having a closed surface 21a, on which the active substance collects, and a side wall 21b disposed about the mouth 12 of the bottle to define a volume for
10 containing a quantity of substance.

Preferably, as shown in all the illustrated embodiments, said closure member 30 is in the form of an upwardly facing, substantially cylindrical or slightly frusto-conical tube piece coaxial with the bottle 11, its lower end being joined to the collection surface 21a of the containing reservoir 21
15 and being closed thereby. The tube piece 30 has an upper end 30' which projects upwards beyond the exit mouth 12 of the bottle associated with the support means 20, the exit mouth 12 being in geometrical relationship with the tube piece 30 such that its inner surface sealedly embraces the lateral surface of the tube piece 30.

20 According to the invention, with said closure member 30 there is associated a passageway 35 enabling the active substance R to pass from the internal chamber of the bottle 11 to the containing reservoir 21, the quantity of active substance collected by this latter being such as to close said passageway 35.

25 According to the first embodiment, shown in Figures 1-6, said passageway 35 for the active substance is defined by a gauged vertical corridor formed

by a valley provided in the cross-section of the lateral surface of the tube piece 30, starting from a point within the chamber of the bottle 11 and terminating below the exit mouth 12 of the bottle 11; said corridor 35 extends along the entire height of the tube piece 30.

- 5 Preferably, the dispenser comprises at least one ventilation passageway 31 which, when in use, connects the internal chamber of the bottle 11 to atmosphere.

In the first embodiment, shown in Figures 1-6, the ventilation passageway 31 is defined by a gauged vertical corridor formed by an arched valley
10 provided in the cross-section of the lateral surface of the tube piece 30, starting from a point below the exit mouth 12 of the bottle and terminating within the chamber of the bottle 11; said corridor 31 extends along the entire height of the tube piece 30.

The corridor 31 is located in a geometrical position relatively far from the
15 corridor 35 for the active substance, and in particular in a diametrically opposite position (see Figure 2).

The reservoir 21 is arranged to contain a determined maximum level of liquid (indicated by L1 in Figures 1A and 3), and to contain the exit mouth 12 of the bottle 11, with its lower end passage section indicated by P1 in
20 Figures 1A and 3 positioned below the maximum liquid level L1 to the side. In the illustrated first embodiment, said reservoir 21 is composed of the wall 25 defining the substantially flat, horizontal collection surface 21a and joined to the hooking means 28, and a substantially vertical, cylindrical side wall 21b, which extends totally about the exit mouth 12.

- 25 The inner diameter of the side wall 21b is greater than the maximum outer diameter of the exit mouth 12, so that this can be contained within the side

wall 21b at a small distance therefrom.

The upper end edge of the side wall 21b determines the maximum level L1 of the liquid which collects within the reservoir 21.

The side wall 21b possesses a number of wall extensions 22b in the form of crenellations, which project upwards beyond the upper edge of the wall 21b to define a resting means for the body 13 of the bottle 11 in order to position the bottle mouth 12 in a predetermined and precise geometrical relationship with the reservoir 21. The bottle 11 possesses a shoulder 13', from which there projects a cylindrical neck 14 carrying the mouth 12 at its end. The crenellations formed by the extensions 22b surround the mouth 12 and neck 14 of the bottle 11 when in an inverted position, to supportingly receive the shoulder 13' on their upper end edges; when in this position the mouth 12 is inserted into the reservoir 21, with its lower exit section P1 lying at a level less than the maximum level L1.

In detail, the mouth 12 comprises an annular element 12a rigidly fixed to the end of the neck 14, to which there is joined a circular disc 12b for hermetically closing the passage port for the active substance R.

The lower end surface of the element 12a defines the lower end passage section P1. This section P1 lies a small distance from the upper edge of the lateral wall 21b of the reservoir 21, so that a narrow passageway (indicated by F) remains defined for the flushing water towards the concavity of the reservoir 21.

Specifically, the tube piece 30 is cut in an inclined manner to form an upper point 30' which projects upwards by an extent such as to penetrate through the mouth 12 of the bottle when placed in its position of use.

To dispose the bottle 11 in its position of use, it is inserted and pushed

manually downwards to cause the tube piece 30 to penetrate into it so that the point of the tube detaches or tears the circular disc 12b from the annular element, to enable the active substance R present in the bottle 11 to descend through the exit mouth 12. The support means 20 together
5 with the thus coupled bottle 11 is then placed in the W.C. bowl such that the collection surface 21a lies substantially horizontal or nearly so, and the flushing water fed into the W.C. bowl strikes the region in which the reservoir 21 lies.

The liquid substance R contained in the bottle 11 descends through the
10 (open) mouth 12 and fills the internal closed space of the tube piece 30; this substance flows outwards only through the corridor 35, from which it descends into the reservoir 21 where it accumulates until it reaches or nearly reaches (but without exceeding it) the maximum level L1, at least in the region surrounding the lower mouth of the corridor 35.

15 Using an active substance R having a viscosity of $1000-3000 \times 10^{-2}$ P (poise), it has been found that if a sufficiently small ventilation passageway 31 is provided, the active substance R does not emerge from the passageway 31.

At this point, as the mouth 12 is hermetically closed, a vacuum
20 environment forms in the upper part D of the internal chamber of the bottle 11 above the level of the active substance R, which in combination with the external atmospheric pressure and the weight of the substance contained in the bottle, reaches static equilibrium, without the substance R emerging from the bottle 11.

25 When a flush is activated, the flushing water penetrates into the reservoir 21 through the gap F and carries away a small quantity of the substance R

contained in the reservoir 21, to dilute it and release its deodorant/
cleansing/refreshing/disinfectant action.

It has been observed experimentally that when a part of the active
substance is carried away, this, probably together with the turbulence
5 produced by the flush, causes a little ventilation air to enter the bottle 11
through the passageway 31 and reach the upper part D. This changes the
equilibrium between the pressure in the bottle and the external pressure in
the reservoir 21, to cause a gauged descent of the level L2, corresponding
to one measure of active substance R, with consequent restoration of the
10 level L1 in the reservoir 21.

For this to happen, the geometrical characteristics of the ventilation
passageway 31 are in relation to the physical-chemical characteristics of
the active substance R (in particular to its viscosity) in order to achieve a
gauged passage of air into the bottle 11, such that the active substance
15 normally does not emerge from the bottle 11, at least to a relevant extent,
whereas it leaves in a gauged manner from the bottle 11 when the flushing
water flow strikes the containing reservoir 21.

Excellent results are obtained with a dispenser in which the cross-section
of the ventilation passageway 31 has an area of 3-6 mm² when the active
20 substance has a viscosity of 1600-2400x10⁻² P (poise).

Moreover, preferably, the distance of the lower section P1 from the
collection surface 21a is relatively small, equal to a few millimetres, the
distance between the maximum level L1 of the reservoir 21 and the lower
section P1 of the mouth 12 being even less. It has been observed that
25 these characteristics can also influence regular ventilation of the bottle 11
through the passageway 31.

To facilitate the washing-away and removal of the active substance R by the water flow, the support means 20 comprises a horizontal platform 23 which surrounds the collection surface 21a of the reservoir 21 and is surrounded in its turn by a vertical wall 24 which defines a relatively wide basin, provided with numerous wide apertures 24' for passage of the water, which surrounds the containing reservoir 21 and the lower portion of the inverted bottle 11.

It has been observed that under certain circumstances a problem can arise, namely that at each flush of water, a little water remains inside the reservoir 21 to replace that part of the active substance R which was carried away, and that as the number of flushes increases the active substance R contained in the bottle 11 becomes increasingly diluted as the level L2 in the bottle falls, until its percentage is excessively low compared with the water. This is obviously unacceptable as the positive action of the active substance gradually falls in intensity as the number of water flushes increases.

This problem is avoided by providing, in the containing reservoir 21, at least one drainage aperture 41 of gauged passage size such as to enable water to pass while preventing passage of the active substance.

In the first embodiment, a drainage aperture 41 in the form of a vertical slot is provided in the side wall 21b of the containing reservoir 21, preferably along its entire height, and having a width of 0.5-2.5 mm in the case of an active substance R of viscosity $1600-2400 \times 10^{-2}$ P (poise). Preferably the slot 41 is positioned a large distance from the passageway 35 for the active substance, in particular close to the ventilation corridor 31.

In this case, it has been observed that after the flushing water has at least partly struck and washed away the contents of the reservoir 21, it drains through the slot 42 together with the more diluted active substance part, leaving inside the reservoir 21 only the more viscous active substance
5 part.

Alternatively, one or more drainage apertures, for example in the form of through holes, can be provided in the collection surface 21a of the containing reservoir 21.

In certain cases, especially with an active substance having a relatively
10 high viscosity and with a water drainage aperture located in a position relatively distant from the passageway for the active substance, it has been observed that the active substance contained in the reservoir 21 falls in level starting from the maximum level point L1, located in
correspondence with the passageway 35, until it becomes practically zero
15 in correspondence with the aperture 41, with the result that the active substance 41 does not emerge from the aperture 41 even if this has a large width.

Figures 7 and 8 show a second embodiment of the invention, which has also given excellent experimental results.

20 This embodiment differs from the preceding only with regard to the ventilation passageway 35. This comprises a thin tubular ventilation conduit 32 positioned within the tube piece 30 to communicate with the air below the lower wall 25 of the containing reservoir 21 and projecting
upwards towards and through the mouth 12 of the bottle 11. The tubular
25 conduit 32 has a circular cross-section and is fixed to the lower wall 25 to rise vertically from it, in a position in the interior of the tube piece 30.

Preferably the lower end passage opening 32" of the conduit 32 is greater than its upper end passage opening 32'.

With this type of dispenser excellent behaviour has been observed even without the water drainage aperture 41.

5 The geometrical characteristics of the ventilation passageway 31, in relation to the viscosity of the active substance R, are determined such that:

- the quantity of ventilation air entering the bottle 11 is sufficient, after each flush (or after a small number of flushes), to cause the upper level
- 10 L2, by virtue of the pressure increase produced inside the bottle, to descend by an amount corresponding to the measure of substance R released into the water flow,
- while at the same time a vacuum level remains inside the bottle which is able to prevent the substance R from overflowing out of the reservoir 21.

15 Preferably, in the ventilation conduit 31, the diameter of the lower end passage opening is greater than the upper end passage opening.

Excellent results are obtained with dispensers in which:

- the lower end opening 32" has a diameter between 3.5 mm and 5 mm,
- the upper end opening 32' has a diameter between 0.3 mm and 1.5 mm,
- 20 - said conduit 32 projects upwards for a length of 5-15 mm,
- if the active substance has a viscosity between $1600-2400 \times 10^{-2}$ P (poise).

In this respect it has been experimentally observed that after each water flush (or after a small number of flushes), a small number of air bubbles

25 penetrate from the outside to the inside of the bottle 11 through the ventilation conduit 32, to influence its pressure and give rise, during

operation, to regular emission of the active substance R at each water flush, the active substance R contained inside the bottle 11 maintaining its active characteristics (deodorant/cleansing/refreshing/disinfectant and the like) substantially constant or nearly constant with time for a relatively large number of flushes (up to 250-450 flushes with 50-55 ml of active substance), and not mixing with the water other than to a relatively small extent at the end of its life.

As an alternative to the tubular conduit 32, said ventilation passageway can consist of a through aperture, in the form of a hole, provided in the lower wall 25 of the containing reservoir 21 in a position facing the bottle mouth (not shown in the figures). Excellent results have been obtained where said through aperture has a diameter between 1 mm and 2 mm for an active substance viscosity of $1600-2400 \times 10^{-2}$ P poise).

In the embodiment shown in Figures 9 and 10, the passageway for the active substance from the bottle 11 to the reservoir 21 is defined by a vertical through slot passing through the wall of the tube piece 30 and starting from a point in the interior of the chamber of the bottle 11, to terminate below the exit mouth 12, this enabling the active substance R to flow to the outside from the interior of the tube piece 30. The slot 36 extends along the entire height of the side wall of the tube piece 30.

The ventilation passageway could also be dispensed with. In this case the aforesaid problem of excessive dilution of the active substance is solved by providing the reservoir 21 with at least one discharge aperture, in the form of a through hole 41, the passage opening of which is sized on the basis of the viscosity of the active substance R, to enable water to pass but to prevent passage of the active substance R.

One or more of said discharge holes 41' are located in the collection surface 21a of the reservoir 21, in particular in that region external to the tube piece 30.

As an alternative to the discharge holes 41', or in combination therewith, a vertical slot can be provided in the side wall 21b of the reservoir (such as that already described with reference to the first embodiment), to preferably extend along the entire height of the wall 21b and having a width such as to enable water to drain but to prevent passage of the active substance R in that this has a greater viscosity.

By virtue of the apertures 41' and/or of said slot, the flush water which tends to collect in the reservoir 21 is effectively drained off, so preventing or at least delaying the dilution of the active substance with time. In other words, a good dispenser life is ensured together with good constancy of the active characteristics (deodorant/cleansing/refreshing/disinfectant and the like) of the substance as the number of flushes progresses.

The presence of holes 41' in the base of the reservoir 21 is preferred if the active substance R has a specific gravity density than water, in that in this case the water tends to gather close to the base of the reservoir 21; in contrast, the slot in the side wall 21b is preferred if the active substance R has a higher specific gravity than water, in that in this case the water tends to remain on top and hence to drain from the upper part of the slot.

Numerous modifications of a practical and applicational nature can be made to the invention, but without leaving the scope of the inventive idea as claimed below.

CLAIMS

1. A liquid active substance dispenser for a W.C. bowl, to be housed within the W.C. bowl, comprising a bottle (11) for containing the active
5 substance (R) in the liquid state and provided with an exit mouth (12) for the active substance (R), and a support means (20) for supporting said bottle (11) in an inverted position, with its mouth (12) facing downwards, in a position subjected to the action of the flushing water flow, said bottle (11) being separate from the support means (20),

10 characterised in that the support means (20) comprises,

for containing the active substance a reservoir (21) located in a position subjected to the action of the flushing water flow and arranged to receive the mouth (12) of the bottle,

15 a member (30) positioned in said containing reservoir (21) to close the mouth (12) of the bottle (11);

for the active substance at least one passageway associated with said closure member (30) to enable the active substance to pass from the internal chamber of the bottle (11) to the containing reservoir (21),

20 said containing reservoir (21) defining a volume for containing a quantity of active substance which closes said passageway for the active substance.

2. A dispenser as claimed in claim 1, characterised by comprising at least one ventilation passageway (31 and 32) which, when in use, connects the internal chamber of the bottle (11) to atmosphere.

3. A dispenser as claimed in claim 1, characterised in that the geometrical characteristics of the ventilation passageway (31, 32) are in relation to the physical-chemical characteristics of the active substance so as to achieve a gauged passage of air into the interior of the bottle (11) such that the active substance does not normally leave the bottle (11), at least not to a relevant extent, whereas it leaves the bottle (11) in a gauged manner when the flushing flow strikes the containing reservoir (21).
4. A dispenser as claimed in claim 3, characterised in that said closure member (30) is in the form of an upwardly facing tube piece closed lowerly by the collection surface (21a) of the containing reservoir (21) and having an upper end which projects upwards beyond the exit mouth (12) of the bottle associated with the support means (20), the exit mouth (12) being in such geometrical relationship with said member (30) as to sealedly embraces its lateral surface.
5. A dispenser as claimed in claim 4, characterised in that the passageway for the active substance is defined by a gauged vertical corridor (35) provided in the lateral surface of the closure member (30) and starting from a point in the interior of the chamber of the bottle (11), to terminate below the exit mouth (12).
6. A dispenser as claimed in claim 4, characterised in that the passageway for the active substance is defined by a through slot (36) passing through the wall of the tube piece (30) and starting from a point in the interior of the chamber of the bottle (11), to terminate below the exit mouth (12).
7. A dispenser as claimed in claim 1, characterised in that the ventilation passageway is defined by a gauged vertical corridor (31)

provided in the lateral surface of the closure member (30) and starting from a point below the exit mouth (12), to terminate in the interior of the chamber of the bottle (11)

8. A dispenser as claimed in claim 7, characterised in that the cross-section of the ventilation passageway (31) has an area of $3-6 \text{ mm}^2$ when the active substance has a viscosity of $1600-2400 \times 10^{-2} \text{ P}$ (poise).

9. A dispenser as claimed in claim 3, characterised in that said ventilation passageway comprises a through aperture located in the lower wall (25) of the containing reservoir (21), in a position facing the mouth of the bottle (11).

10. A dispenser as claimed in claim 9, characterised in that said through aperture has a diameter between 1 and 2 mm when the active substance has a viscosity of $1600-2400 \times 10^{-2} \text{ P}$ (poise).

11. A dispenser as claimed in claim 4, characterised in that said ventilation passageway comprises a ventilation conduit (32) positioned within said tube piece (30) to communicate with the air below the lower wall (25) of the containing reservoir (21) and projecting upwards towards the mouth (12) of the bottle.

12. A dispenser as claimed in claim 11, characterised in that the lower end passage opening (32'') of the ventilation conduit (32) is larger than the upper end passage opening (32') thereof.

13. A dispenser as claimed in claim 12, characterised in that said lower end opening (32'') has a diameter between 3.5 mm and 5 mm and said upper end opening (32') has a diameter between 0.3 mm and 1.5 mm when the active substance has a viscosity of $1600-2400 \times 10^{-2} \text{ P}$ (poise).

14. A dispenser as claimed in claim 11, characterised in that said

tubular conduit (32) projects upwards for a length of 5-15 mm when the active substance has a viscosity of $1600-2400 \times 10^{-2}$ P (poise).

15. A dispenser as claimed in claim 1, characterised in that said containing reservoir (21) has an upward facing concavity positioned in the
5 region subjected to the water flow and arranged to contain a determined maximum level of liquid, and to contain the exit mouth 12 of the bottle with its lower end passage section (P1) positioned below the maximum level (L1) of liquid present in the reservoir (21).

16. A dispenser as claimed in claim 1, characterised in that said
10 containing reservoir (21) comprises at least one drainage aperture (41, 41') having a passage opening sized such as to enable water to pass but to prevent passage of the active substance.

17. A dispenser as claimed in claim 16, characterised in that said
15 drainage aperture is in the form of a vertical slot (41) provided in the side wall (21b) of the containing reservoir (21).

18. A dispenser as claimed in claim 16, characterised in that one or more of said drainage apertures (41') are located in the collection surface (21a) of the containing reservoir (21).

19. A dispenser as claimed in claim 1, characterised in that said
20 containing reservoir (21) comprises at least one water drainage aperture (41) located in a position relatively distant from the active substance passageway (35) in relation to the viscosity of the active substance, such that this does not emerge to a relevant extent from the aperture (41).

AMENDED CLAIMS

[received by the International Bureau on 19 march 2003 (19.03.03);
original claim 1 replaced by new claim 1;
remaining claims unchanged (1 page)]

1. A liquid active substance dispenser for a W.C. bowl, to be housed within the W.C. bowl, comprising a bottle (11) for containing the active substance (R) in the liquid state and provided with an exit mouth (12) for the active substance (R), and a support means (20) for supporting said bottle (11) in an inverted position, with its mouth (12) facing downwards, in a position subjected to the action of the flushing water flow, said bottle (11) being separate from the support means (20),
the support means (20) comprising for containing the active substance a reservoir (21) located in a position subjected to the action of the flushing water flow and arranged to receive the mouth (12) of the bottle,
characterised in that the support means (20) comprises
a member (30) positioned in said containing reservoir (21) to close the mouth (12) of the bottle (11); and
for the active substance at least one passageway associated with said closure member (30) to enable the active substance to pass from the internal chamber of the bottle (11) to the containing reservoir (21),
said containing reservoir (21) comprising a passageway (F) for the flushing water entering the concavity of the reservoir (21) and defining a volume for containing the mouth (12) of the bottle (11) and a quantity of active substance whose maximum level (L1) is at a upper level than the lower exit section (P1) of the mouth (12) so that it closes said passageway for the active substance.
2. A dispenser as claimed in claim 1, characterised by comprising at least one ventilation passageway (31 and 32) which, when in use, connects the internal chamber of the bottle (11) to atmosphere.

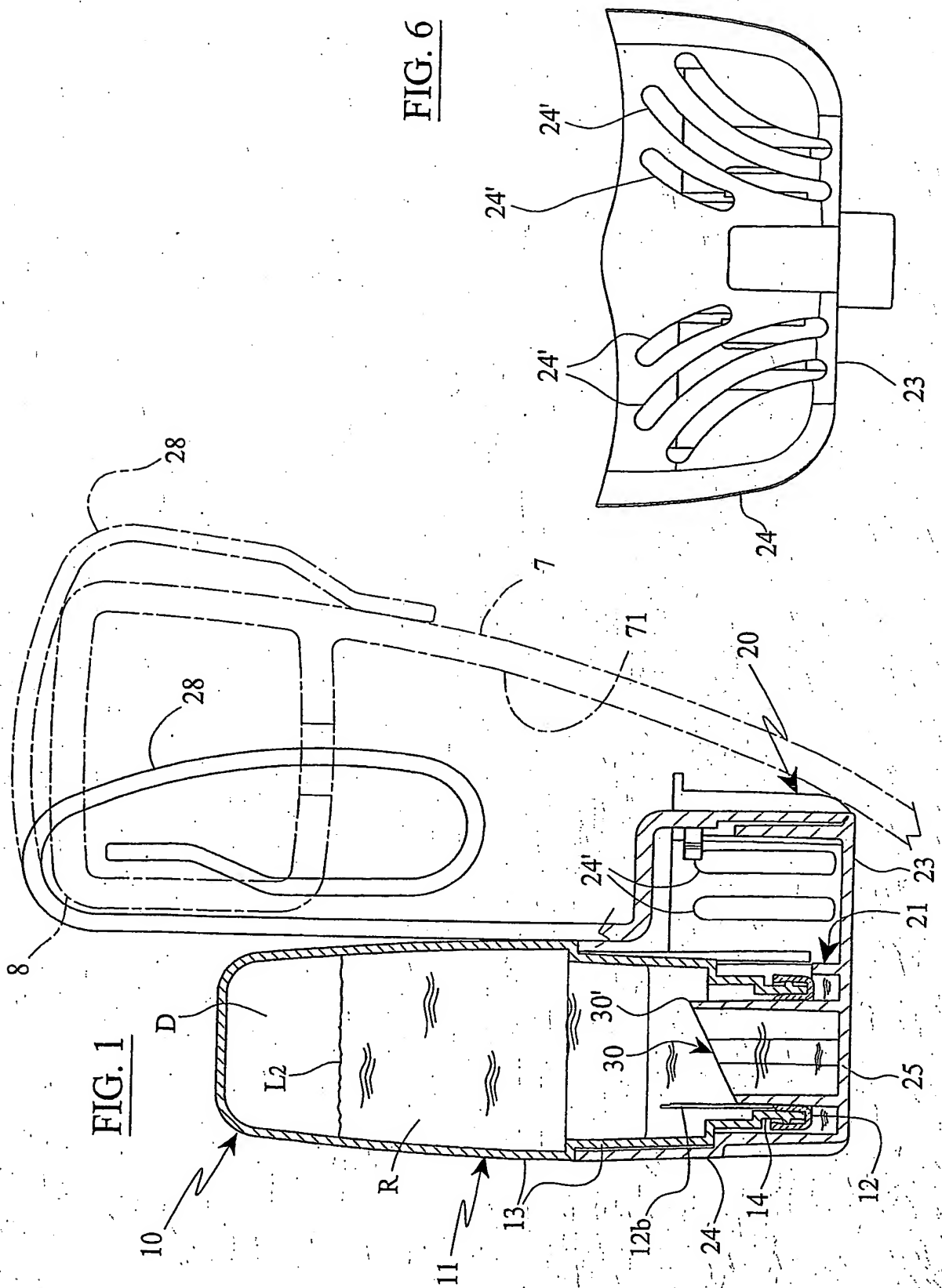


FIG. 6

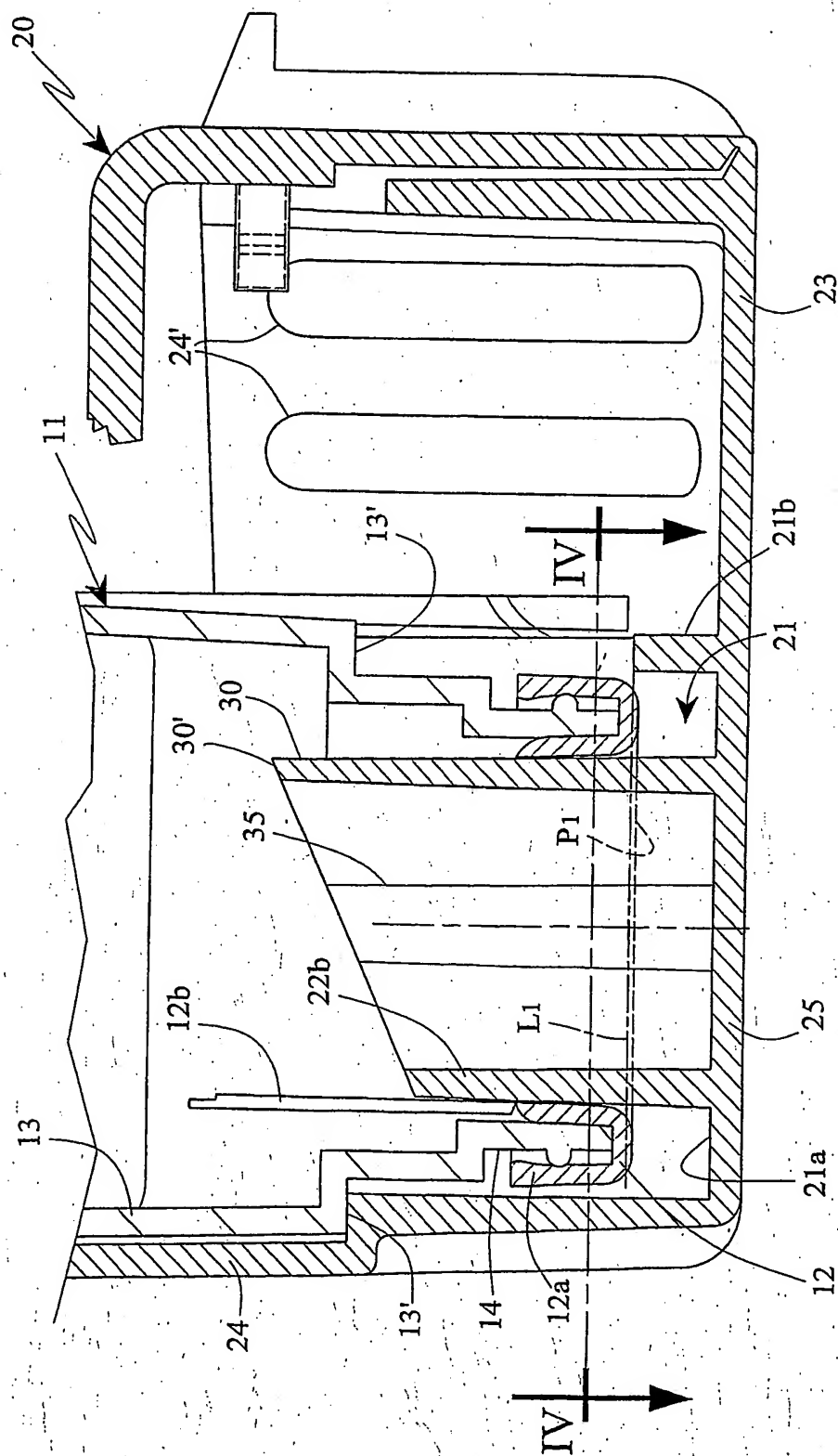


FIG. 1A

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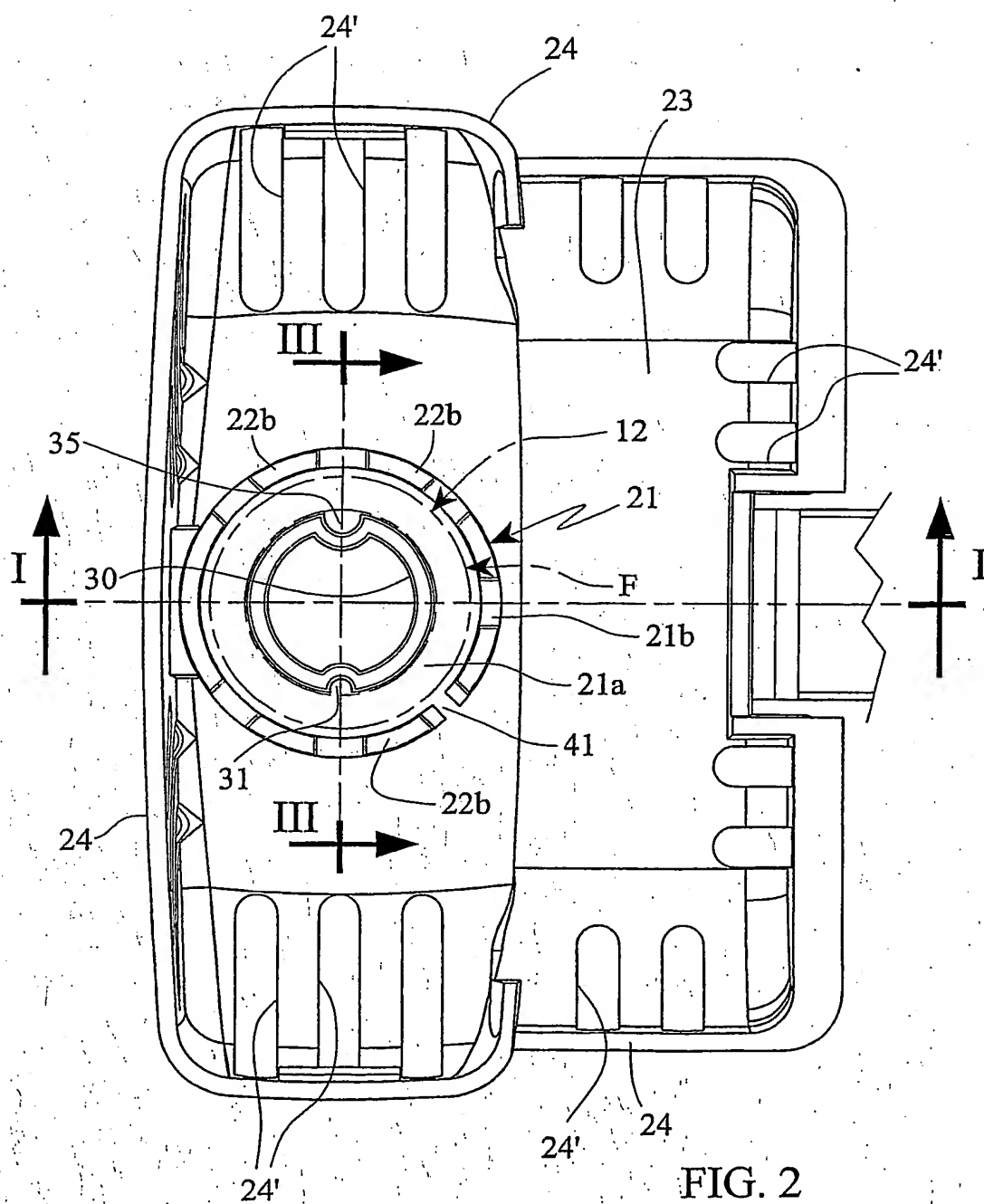


FIG. 2

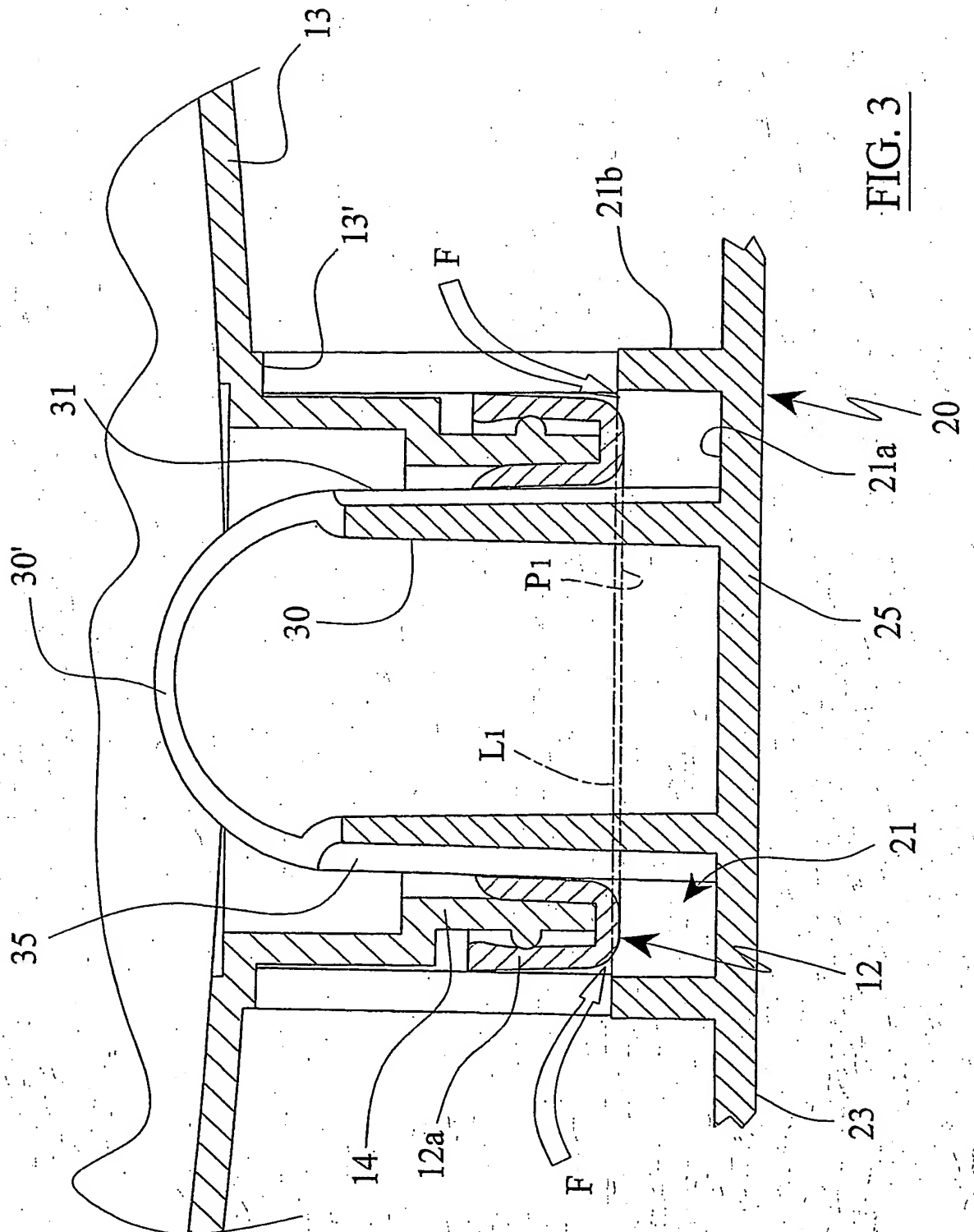


FIG. 3

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FIG. 4

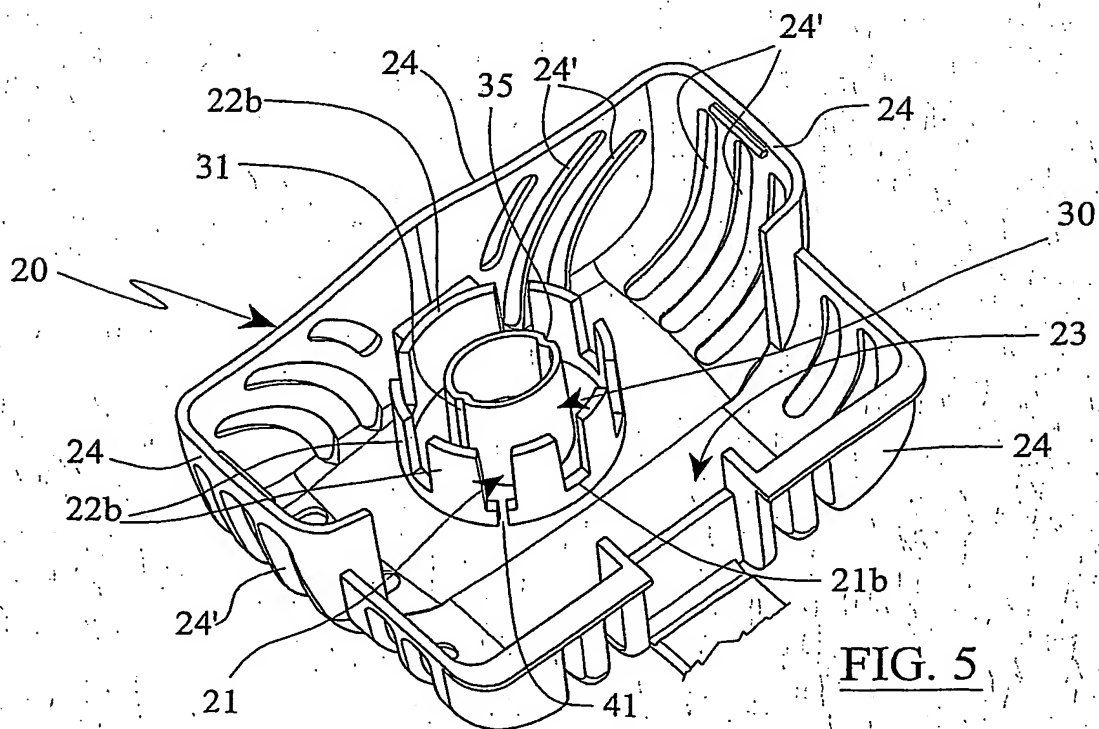
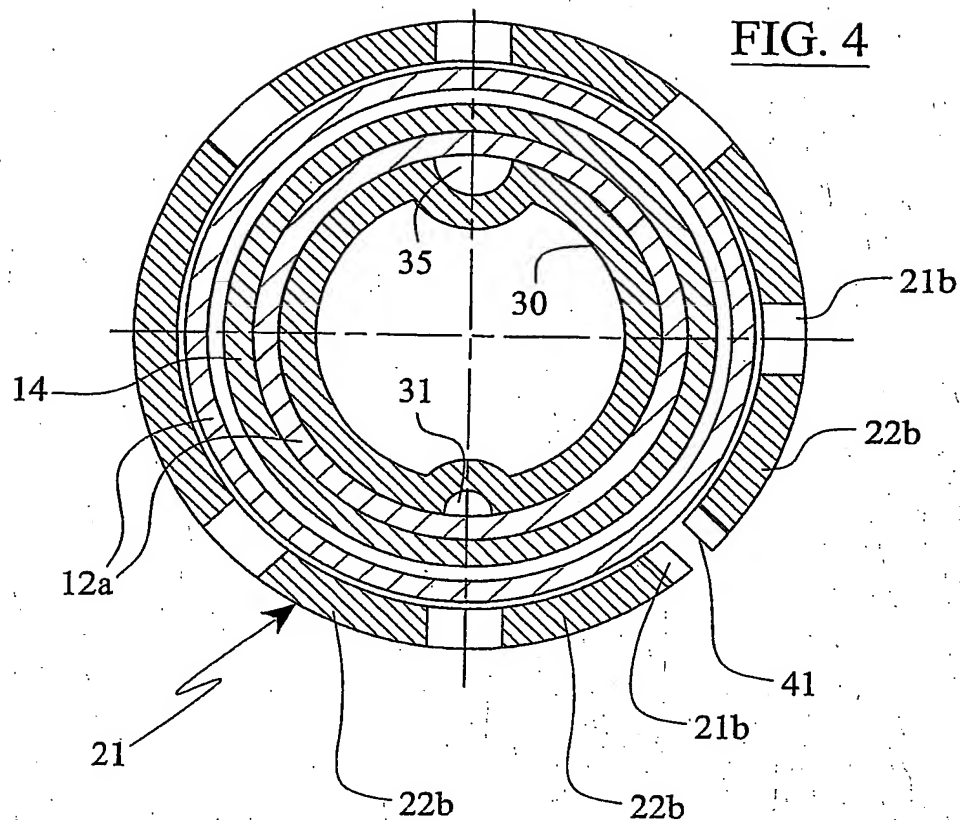
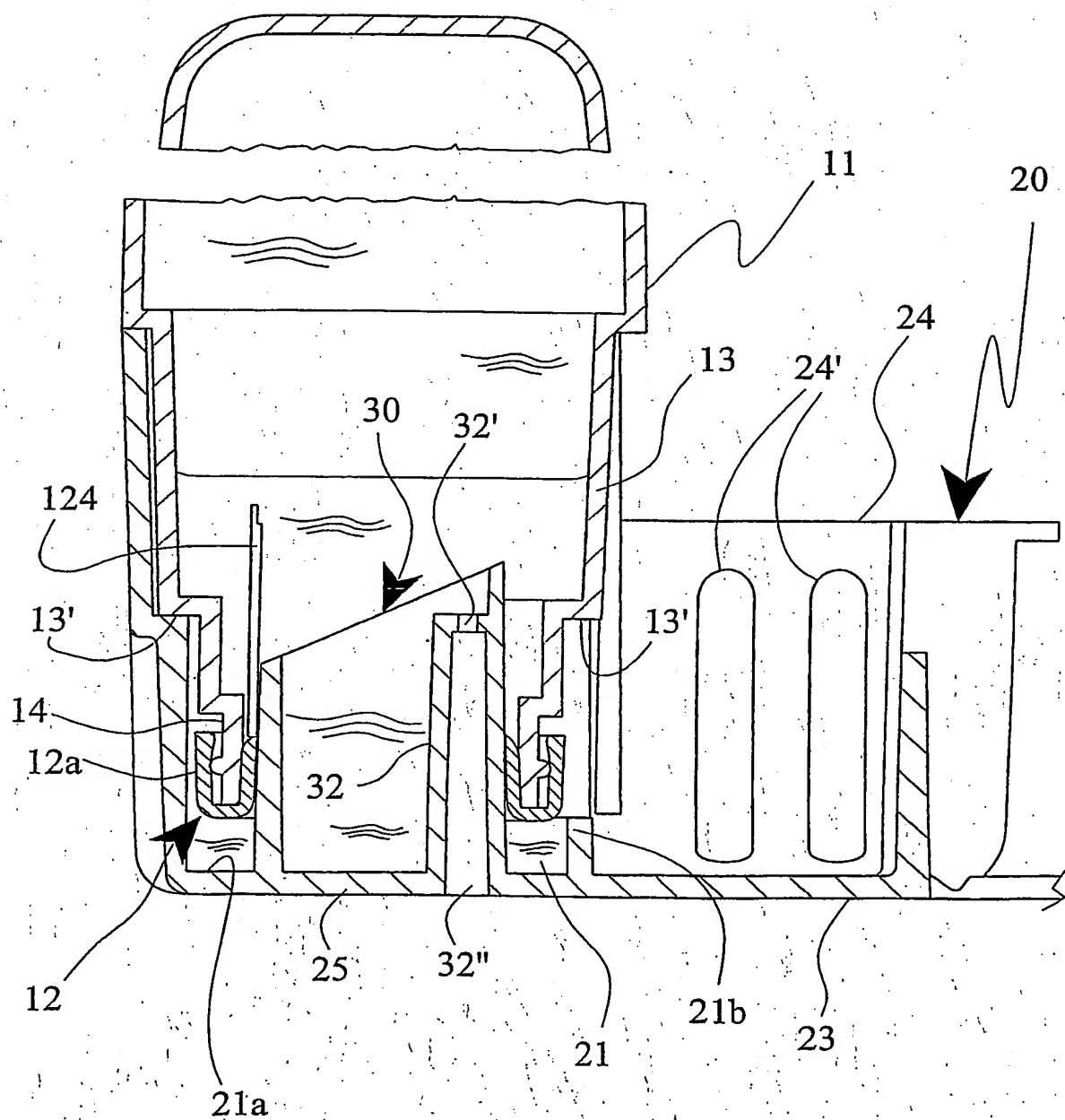


FIG. 5

FIG. 7



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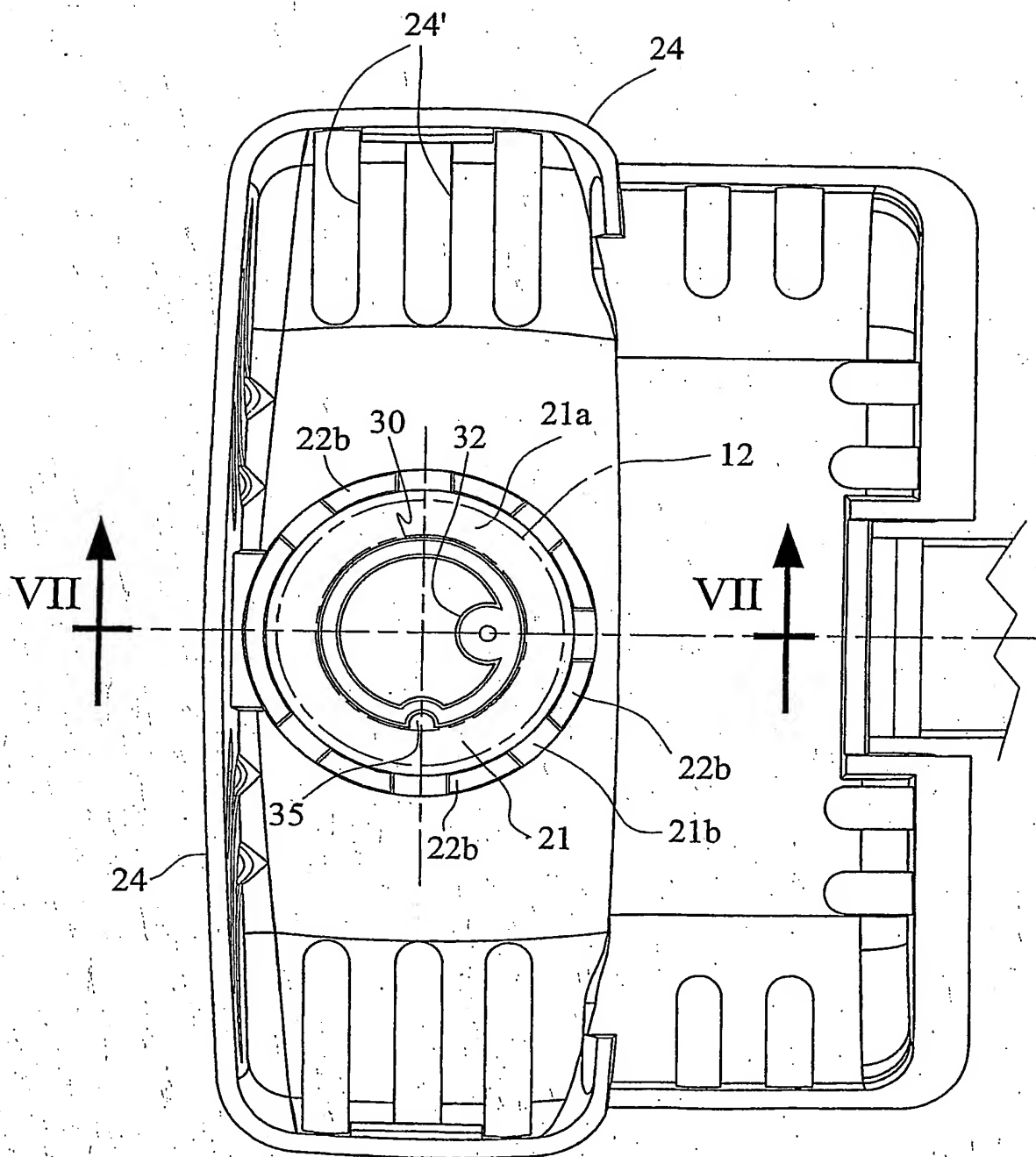
FIG. 8

FIG. 9

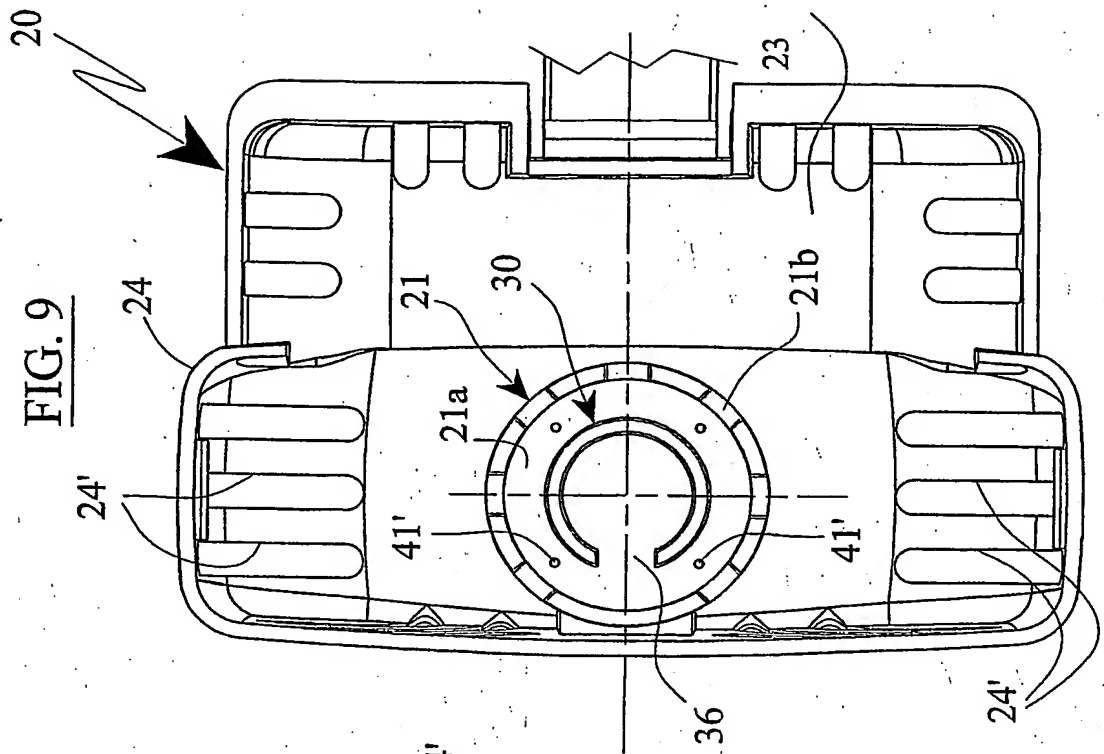
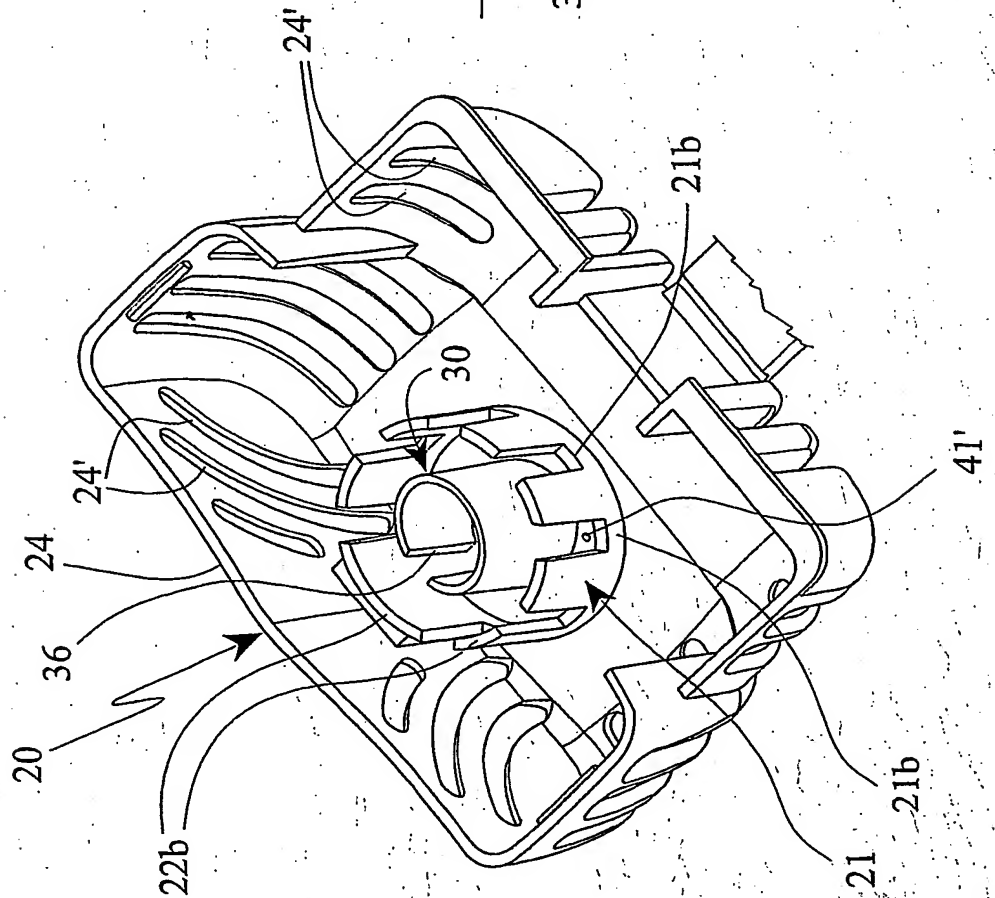


FIG. 10



INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 02/11765

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 E03D9/03

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 E03D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 01-44590 A (JOHNSON & SON INC S C) 21 June 2001 (2001-06-21) abstract; figures 1,8,15,15A,16,26 page 3, line 1 - line 19 page 4, line 27 -page 5, line 10 page 14, line 18 - line 29 page 20, line 23 -page 21, line 6 page 22, line 9 -page 23, line 11	1-5,7,9, 11,19
X	DE 199 15 322 C (HENKEL KGAA) 18 January 2001 (2001-01-18) abstract; figures 1,2 column 2, line 38 - line 53 column 3, line 16 - line 61 column 8, line 37 - line 67	1-4,9, 15,19
	-/-	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

15 January 2003

Date of mailing of the international search report

24/01/2003

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INTERNATIONAL SEARCH REPORT

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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X	WO 01 32995 A (SLADE BRIAN PARRY) 10 May 2001 (2001-05-10) abstract; figures 2,4 page 7, line 14 - line 26 page 9, line 1 - line 25	1-3,19

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